

What is claimed is:

1. A cryoplasty apparatus, comprising:  
a catheter having a proximal and a distal end;  
a cooling member disposed at the distal end of the catheter;  
a pull cord coupled to the cooling member; and  
a sheath that couples the pull cord and the catheter.
2. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member includes a balloon.
3. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises at least one electrode.
4. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises at least one pad printed conductive electrode.
5. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises at least one thermo-resistive sensor.
6. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a support member.

7. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a mesh cage and at least one cryoplasty chamber.

8. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a cryoplasty ring.

9. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a heat exchange surface connected to a cooling tube.

10. The cryoplasty apparatus in accordance with claim 9, wherein the heat exchange surface is slidable.

11. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a slidable and rotatable sprayer.

12. The cryoplasty apparatus in accordance with claim 1, wherein the cooling member further comprises a cryoplasty assembly, the cryoplasty assembly comprising a mesh and an outer surface.

13. The cryoplasty apparatus in accordance with claim 1, wherein the pull cord includes a pull cord.

14. The cryoplasty apparatus in accordance with claim 1, wherein the pull cord is disposed on the cooling member.

15. The cryoplasty apparatus in accordance with claim 1, wherein the catheter is at least in part surrounded by an insulating sheath which in part defines a vacuum lumen.

16. A cryoplasty apparatus, comprising:

a catheter having a proximal end and a distal end, the catheter defining an inflation lumen, a coolant intake lumen, and exhaust lumen therethrough, each lumen having a proximal end and a distal end proximate the proximal and distal ends of the catheter respectively;

a cooling member disposed at the distal end of the catheter and in fluid communication with the inflation lumen;

a pull cord coupled to the cooling member; and

a sheath that couples the pull cord and the catheter.

17. The cryoplasty apparatus in accordance with claim 16, further comprising a source of coolant being connected to the proximal end of the catheter in fluid communication with the intake lumen.

18. The cryoplasty apparatus in accordance with claim 17, wherein the coolant source is liquid N<sub>2</sub>.

19. The cryoplasty apparatus in accordance with claim 16, wherein the catheter further defines a guidewire lumen.

20. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member includes a balloon.

21. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises at least one electrode.

22. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises at least one pad printed conductive electrode.

23. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises at least one thermo-resistive sensor.

24. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a support member.

25. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a mesh cage and at least one cryoplasty chamber.

26. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a cryoplasty ring.

27. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a heat exchange surface connected to a cooling tube.

28. The cryoplasty apparatus in accordance with claim 27, wherein the heat exchange surface is slidable.

29. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a slidable and rotatable sprayer.

30. The cryoplasty apparatus in accordance with claim 16, wherein the cooling member further comprises a cryoplasty assembly, the cryoplasty assembly comprising a mesh and an outer surface.

31. The cryoplasty apparatus in accordance with claim 16, wherein the pull cord includes a guidewire.

32. The cryoplasty apparatus in accordance with claim 16, wherein the pull cord is disposed on the cooling member.

33. The cryoplasty apparatus in accordance with claim 16, wherein the catheter is at least in part surrounded by an insulating sheath which in part defines a vacuum lumen.

34. A method of causing cold-induced necrosis, comprising the steps of:

advancing across a target site a catheter having a proximal end and a distal end, the catheter defining an inflation lumen, a coolant intake lumen, and exhaust lumen therethrough, each lumen having a proximal end and a distal end proximate the proximal and distal ends of the catheter respectively; a cooling member disposed at the distal end of the catheter and in fluid communication with the inflation lumen; a pull cord coupled to the cooling member; and a sheath that couples the pull cord and the catheter;

delivering coolant through the inflation lumen into the cooling member;

killing cells within a target site; and

removing coolant from the cooling member through the drain lumen.

35. The method in accordance with claim 34, wherein the cooling member further comprises a source of coolant being connected to the proximal end of the catheter in fluid communication with the intake lumen.

36. The method in accordance with claim 35, wherein the coolant source is liquid N<sub>2</sub>.

37. The method in accordance with claim 35, wherein the catheter further defines a guidewire lumen.

38. The method in accordance with claim 35, wherein the cooling member includes a balloon.

39. The method in accordance with claim 34, wherein the cooling member further comprises at least one electrode.

40. The method in accordance with claim 34, wherein the cooling member further comprises at least one pad printed conductive electrode.

41. The method in accordance with claim 34, wherein the cooling member further comprises at least one thermo-resistive sensor.

42. The method in accordance with claim 34, wherein the cooling member further comprises a support member.

43. The method in accordance with claim 34, wherein the cooling member further comprises a mesh cage and at least one cryoplasty chamber.

44. The method in accordance with claim 34, wherein the cooling member further comprises a cryoplasty ring.

45. The method in accordance with claim 34, wherein the cooling member further comprises a heat exchange surface connected to a cooling tube.

46. The method in accordance with claim 45, wherein the heat exchange surface is slidable.

47. The method in accordance with claim 34, wherein the cooling member further comprises a slidable and rotatable sprayer.

48. The method in accordance with claim 34, wherein the cooling member further comprises a cryoplasty assembly, the cryoplasty assembly comprising a mesh and an outer surface.

49. The method in accordance with claim 34, wherein the pull cord includes a guidewire.

50. The method in accordance with claim 34, wherein the pull cord is disposed on the cooling member.

51. The method in accordance with claim 34, wherein the catheter is at least in part surrounded by an insulating sheath which in part defines a vacuum lumen.



52. The method in accordance with claim 34, wherein the target region is an atrium.

53. The method in accordance with claim 34, wherein the target region is a pulmonary artery.

54. The method in accordance with claim 34, wherein the target region is a pulmonary vein.